

QUIZ, FEB 1

NAME:

0.1. **Lengths of Curves.** Find the length of the curve given by the following parametric equations where $1 \leq t \leq 3$

$$x(t) = \frac{t^2}{2}$$

$$y(t) = (2t + 9)^{\frac{3}{2}}$$

0.2. **Polar Graphs.** Graph the polar equation $r(\theta) = \frac{1}{\sqrt{2}} (\cos(\theta) + \sin(\theta))$ where θ goes from 0 to π .

0.3. **Vector Geometry.** Use vectors to show that diagonals of a square are perpendicular to each other.

Bonus Problem. Suppose that \vec{a}_i are a bunch of vectors forming the boundary of a polygon. Show that for any vector \vec{b} , we have

$$\vec{b} \cdot \vec{a}_1 + \vec{b} \cdot \vec{a}_2 + \cdots + \vec{b} \cdot \vec{a}_n = 0$$